

Claims

1. Device for eliminating unwanted volatile components from beer wort, comprising a column (1) comprising :
- means (2) for uniformly distributing the beer wort
- 5 inside said column (1) in a first direction,
- means (10) for uniformly distributing a current of inert gas or steam inside the column (1) in a second direction, preferably opposite to said first direction, and
 - means for increasing the surface area of contact of
- 10 said wort inside said column (1) with said current of inert gas or steam.
2. Device according to claim 1 wherein said means for uniform distribution of the wort comprise a distribution plate (2), the plane passing through said distribution plate (2) being substantially perpendicular to the longitudinal axis of the column (1), said distribution plate (2) being disposed at the same level as the wort feed of the column (1), which is preferably in the top part of said column, said distribution plate (2) including first
- 15 means for uniform flow of the wort in said first direction and second means for flow of said current of inert gas or steam in said second direction.
3. Device according to claim 2 wherein the first means for uniform flow of the wort comprise a plurality of orifices (19) in said distribution plate (2).
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4. Device according to claim 2 wherein the second means for flow of said current of inert gas or steam comprise a plurality of chimneys (20) on the surface of said distribution plate (2).
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5. Device according to claim 4 wherein the chimneys (20) have a height sufficient to prevent the wort on top of said distribution plate (2) flowing through said chimneys (20) when the column (1) is operating.
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6. Device according to claim 1 wherein said means for increasing the surface area of contact of the wort with a current of inert gas or steam comprise a plurality of rings

disposed randomly on a bottom plate (8) and forming a diffuse array of stacked rings, said diffuse array being located under said means (2) for uniform distribution of the wort.

5 7. Device according to claim 6 wherein the plane passing through the bottom plate (8) is substantially perpendicular to the longitudinal axis of the column (1) and said bottom plate (8) has means for increasing the surface area of contact, said means being additionally adapted to reduce the resistance to the flow of said current of inert gas or steam.

10 8. Device according to claim 7 wherein the bottom plate (8) has corrugations over at least part of its surface and a plurality of orifices (21) arranged on its surface.

15 9. Device according to claim 6 or claim 7 wherein the bottom plate (8) is a corrugated grid.

20 10. Device according to claim 1 characterised in that the means (10) for uniform distribution of a current of inert gas or steam comprise a main pipe (22), optionally communicating with secondary pipes (23), disposed at the level of the region from which the treated wort is extracted, which is preferably in the bottom part of the column (1), and having a plurality of orifices (25) regularly arranged on the greater part of the main pipe (22) and the secondary pipes (23) so that the current of inert gas or steam can be fed into the interior of the column (1) over substantially all of the cross-section of said column (1).

25 30 11. Device according to claim 10 wherein the orifices (25) are directed towards the bottom of the column (1).

35 12. Device according to claim 1 comprising means for collecting the treated wort without significant formation of foam.

30 35 13. Device according to claim 12 characterised in that the means for recovering the treated wort comprise at least

one preferably inclined surface (11) directed towards the bottom of the column (1) and in the bottom part of said column (1), said surface (11) having means (11a) forming a baffle directed towards the bottom of said column (1).

5 14. Device according to any one of claims 1 to 13 wherein the first direction in which the wort is distributed is downwards and the second direction in which the current of inert gas or steam is distributed is upwards.

10 15. Device according to any one of claims 1 to 14 further comprising additional means for cleaning the interior of the column (1).

15 16. Device according to claim 15 wherein the cleaning means comprise a plurality of distributors of washing or rinsing liquid located at the level of the means (2) for distribution of the wort, at the level of the means for increasing the surface area of contact of the wort with said current of inert gas or steam, at the level of the means (10) for distributing a current of inert gas or steam, at the level of the means (11, 11a) for collecting the treated wort, said distributors being connected to external command and control means.

20 17. Device according to any one of claims 1 to 16 further comprising a system (4) for heating the wort before it enters the column (1), said heating system (4) being connected to the column (1) by pipe means (4a).

25 18. Device according to any one of claims 1 to 17 further comprising means for extracting the current of inert gas or steam.

30 19. Device according to claim 18 wherein the extractor means comprise one or more valves in the top part of the column (1) and releasing the inert gas or the steam to the exterior of the column (1).

35 20. Device according to any one of claims 1 to 17 further comprising means for recovering the current of inert gas or steam and the condensates.

21. Device according to claim 20 wherein the means for recovering the current of steam and condensates comprise one or more condensers (14) connected to the top part of the column (1) by pipe means.

5 22. Device according to any one of claims 1 to 21 further comprising means for regulating and/or controlling the flowrate of the wort entering the column (1).

10 23. Device according to any one of claims 1 to 21 further comprising means for regulating and/or controlling the flowrate of the current of inert gas or steam into the column (1).

15 24. Device according to claim 22 or claim 23 wherein the regulation and/or control means comprise solenoid valves and/or pneumatic valves.

15 25. Method of eliminating unwanted volatile components from beer wort without significant evaporation, comprising a first step of boiling the wort at a temperature varying between approximately 90°C and approximately 150°C, followed by a second step of separating unwanted volatile components from said wort carried out in a device as claimed in any one of claims 1 to 24.

20 26. Method according to claim 25 wherein the internal pressure in the column is controlled in accordance with the temperature of the wort entering the column.

25 27. Use for the elimination of unwanted volatile components from beer wort of a device as claimed in any one of claims 1 to 24.

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